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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,684	11/30/2001	Leo Medeiros	60130-1280/00MRA0088	7366

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EXAMINER
WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
1742	4

DATE MAILED: 02/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-4

Office Action Summary	Application No.	Applicant(s)	
	09/998,684	MEDEIROS ET AL.	
	Examiner	Art Unit	
	Harry D Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 30 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inawa et al (US 5,665,179) in view of Keil et al (US 6,024,893)

Inawa et al teach the invention substantially as claimed. Inawa et al teach (se abstract) a method of making a steel coil spring that includes gas nitriding.

However, Inawa et al do not teach regulating a nitriding potential in the nitriding atmosphere to control the step of nitriding.

Keil et al teach (see abstract) a method of controlling the nitriding potential during nitriding. The method produces high quality nitrided parts.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the nitriding potential controlling method of Keil et al in the method of Inawa et al because the controlling method produces high quality nitrided parts.

Regarding claim 2, the method of Keil et al monitors (see abstract) the oxygen content of the furnace atmosphere by means of an oxygen probe.

Regarding claim 3, Inawa et al teach (see col 4, lines 10-24) that the nitriding includes treatment by ammonia.

Regarding claim 4, Inawa et al teach (see abstract and col 4, lines 4-24) that the method includes grinding of the surface, and heating to 420-550°C to perform the nitriding. The process of Inawa et al does not expressly disclose a cooling step, but in order to use the nitrided spring, it would have to be cooled to ambient temperature from the nitriding temperature. The grinding of the surface disclosed by Inawa et al cleans the surface by removing any oxide scale present.

Regarding claim 5, Inawa et al teach nitriding at 420-550°C.

Regarding claim 8, Inawa et al teach (see abstract) further subjecting the steel spring to shot peening.

Regarding claim 9, Inawa et al teach (see col 4, lines 25-48) two separate steps of shot peening, one with 0.6-1.0 mm shot and one with 0.15-0.3 mm shot. It would have been obvious to one of ordinary skill in the art to have combined these two steps and to have performed one shot peening with shot of both 0.8 mm and 0.3 mm diameter.

Regarding claim 10, Inawa et al teach a method of making a steel spring including (1) cleaning the surface by grinding, (2) heating the spring to a (3) nitriding temperature, (4) cooling the spring to ambient and (5) shot peening the spring. Inawa et al does not teach the step of regulating a nitriding potential. However, it would have been obvious to one of ordinary skill in the art to have used the nitriding potential controlling method of Keil et al in the method of Inawa et al because the controlling method produces high quality nitrided parts.

Regarding claim 11, Inawa et al in view of Keil et al teach (as above) a steel coil spring that has a surface and a diffusion zone produced by nitriding the surface by regulation of a nitriding potential.

Regarding claim 12, Inawa et al teach (see col 4, lines 10-24) that the nitriding includes treatment by ammonia.

Regarding claim 13, Inawa et al teach nitriding at 420-550°C.

3. Claims 1 and 3-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inawa et al (US 5,665,179) in view of Applicant's admission of prior art and "Modern Surface Treatments".

Inawa et al teach the invention substantially as claimed. Inawa et al teach (se abstract) a method of making a steel coil spring that includes gas nitriding.

However, Inawa et al do not teach regulating a nitriding potential in the nitriding atmosphere to control the step of nitriding.

Applicant admits as prior art (see page 1, paragraph 6) that one known process is the Nitreg® process.

"Modern Surface Treatments" describes the Nitreg® process. The Nitreg® process involves nitriding of a workpiece while controlling the nitriding potential. The Nitreg® process delivers excellent and consistent results.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the Nitreg® method in the method of Inawa et al because the Nitreg® method produces high quality nitrided parts consistently.

Regarding claim 3, Inawa et al teach (see col 4, lines 10-24) that the nitriding includes treatment by ammonia.

Regarding claim 4, Inawa et al teach (see abstract and col 4, lines 4-24) that the method includes grinding of the surface, and heating to 420-550°C to perform the nitriding. The process of Inawa et al does not expressly disclose a cooling step, but in order to use the nitrided spring, it would have to be cooled to ambient temperature from the nitriding temperature. The grinding of the surface disclosed by Inawa et al cleans the surface by removing any oxide scale present.

Regarding claim 5, Inawa et al teach nitriding at 420-550°C.

Regarding claims 6 and 7, "Modern Surface Treatments" teaches (see page 2, paragraph 8 and figure 1) that the Nitreg® process can produce any combinations of W/L (white layer-i.e.-the compound layer) diffusion. In figure 1, examples include a 55 μm diffusion zone with a 0 μm white layer.

Regarding claim 8, Inawa et al teach (see abstract) further subjecting the steel spring to shot peening.

Regarding claim 9, Inawa et al teach (see col 4, lines 25-48) two separate steps of shot peening, one with 0.6-1.0 mm shot and one with 0.15-0.3 mm shot. It would have been obvious to one of ordinary skill in the art to have combined these two steps and to have performed one shot peening with shot of both 0.8 mm and 0.3 mm diameter.

Regarding claim 10, Inawa et al teach a method of making a steel spring including (1) cleaning the surface by grinding, (2) heating the spring to a (3) nitriding

temperature, (4) cooling the spring to ambient and (5) shot peening the spring. Inawa et al does not teach the step of regulating a nitriding potential. However, it would have been obvious to one of ordinary skill in the art to have used the Nitreg® method in the method of Inawa et al because the Nitreg® method produces high quality nitrided parts consistently.

Regarding claim 11, Inawa et al in view of Applicant's admission and "Modern Surface Treatments" teach (as above) a steel coil spring that has a surface and a diffusion zone produced by nitriding the surface by regulation of a nitriding potential.

Regarding claim 12, Inawa et al teach (see col 4, lines 10-24) that the nitriding includes treatment by ammonia.

Regarding claim 13, Inawa et al teach nitriding at 420-550°C.

Regarding claims 14 and 15, "Modern Surface Treatments" teaches (see page 2, paragraph 8 and figure 1) that the Nitreg® process can produce any combinations of W/L (white layer-i.e.-the compound layer) diffusion. In figure 1, examples include a 55 μm diffusion zone with a 0 μm white layer.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kondo et al (US 3,748,195) teach (as per figure 2) that the nitrided case depth is dependent upon the time of the nitriding treatment.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 6:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III
Examiner
Art Unit 1742

hdw
January 24, 2003

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700